

Please type a plus sign (+) inside this box → ☒

PTO/SB/50 (08-00)
Approved for use through 12/30/2000. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

REISSUE PATENT APPLICATION TRANSMITTAL

Address to:

Assistant Commissioner for Patents
Box Reissue
Washington, DC 20231

Attorney Docket No. 3323-P0001C
First Named Inventor Lars Severi
Original Patent Number 5,883,035
Original Patent Issue Date (Month/Day/Year) 11/10/98
Express Mail Label No. EL570204551US

APPLICATION FOR REISSUE OF:

(Check applicable box)



Utility Patent



Design Patent



Plant Patent

APPLICATION ELEMENTS (37 CFR 1.173)

1. ☒ Fee Transmittal Form (PTO/SB/56)
(Submit an original, and a duplicate for fee processing)
2. ☐ Applicant claims small entity status. See 37 CFR 1.27.
3. ☒ Specification and Claims in double column copy of patent format (amended, if appropriate)
4. ☒ Drawing(s) (proposed amendments, if appropriate)
5. ☒ Reissue Oath/Declaration (original or copy)
(37 C.F.R. § 1.175) (PTO/SB/51 or 52)
6. Original U.S. Patent currently assigned?
☒ Yes ☐ No
(If Yes, check applicable box(es))
☒ Written Consent of all Assignees (PTO/SB/53)
☒ 37 C.F.R. § 3.73(b) Statement ☒ Power of Attorney (PTO/SB/96)

ACCOMPANYING APPLICATION PARTS

7. ☐ Statement of status/support for all changes to the claims. See 37 CFR 1.173 (c).
8. ☐ Original U.S. Patent for surrender
☐ Ribboned Original Patent Grant
☐ Statement of Loss (PTO/SB/55)
9. ☒ Foreign Priority Claim (35 U.S.C. 119)
(if applicable)
10. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
11. ☐ English Translation of Reissue Oath/Declaration
(if applicable)
12. ☒ Preliminary Amendment
13. ☒ Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)
14. Other: See attached list.....
.....
.....

15. CORRESPONDENCE ADDRESS



Customer Number or Bar Code Label



Correspondence address below

(Insert Customer No. or Attach bar code label here)

24126

Name

Wesley W. Whitmyer, Jr. PATENT TRADEMARK OFFICE

Address

986 Bedford Street

City

Stamford

State

CT

Zip Code

06905

Country

United States

Telephone

203-324-6155

Fax

203-327-1096

NAME (Print/Type)

Richard J. Basile

Registration No. (Attorney/Agent)

40,501

Signature


Richard J. Basile

Date

11/10/00

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO Assistant Commissioner for Patents, Box Reissue, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

REISSUE APPLICATION FEE TRANSMITTAL FORM						Docket Number (Optional) 3323-P0001C		
Claims as Filed - Part 1								
Claims in Patent		Number Filed in Reissue Application	(3) Number Extra	Small Entity		Other than a Small Entity		
				Rate	Fee	Rate	Fee	
(A) 12	Total Claims (37 CFR 1.16(j))	(B) 24	**** 4 =	x \$ _____ =		or	x \$18 = 72	
(C) 3	Independent claims (37 CFR 1.16(i))	(D) 5	* 2 =	x \$ _____ =			x \$80 = 160	
				Basic Fee (37 CFR 1.16(h)) \$ 710			\$710	
				Total Filing Fee \$		OR	\$ 942.00	
Claims as Amended - Part 2								
	(1) Claims Remaining After Amendment		(2) Highest Number Previously Paid For	(3) Extra Claims Present	Small Entity		Other than a Small Entity	
					Rate	Fee	Rate	Fee
Total Claims (37 CFR 1.16(f))	*** 4	MINUS	** 24	* =	x \$ _____ =		x \$ _____ = 0	
Independent Claims (37 CFR 1.16(i))	*** 1	MINUS	***** 5	=	x \$ _____ =		x \$ _____ = 0	
					Total Additional Fee \$	OR	\$ 0	
<p>* If the entry in (D) is less than the entry in (C), Write "0" in column 3.</p> <p>** If the "Highest Number of Total Claims Previously Paid For" is less than 20, Write "20" in this space.</p> <p>*** After any cancellation of claims.</p> <p>**** If "A" is greater than 20, use (B - A); if "A" is 20 or less, use (B - 20).</p> <p>***** "Highest Number of Independent Claims Previously Paid For" or Number of Independent Claims in Patent (C).</p> <p><input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.</p> <p><input type="checkbox"/> Please charge Deposit Account No. _____ in the amount of _____. A duplicate copy of this sheet is enclosed.</p> <p><input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees under 37 CFR 1.16 or 1.17 which may be required, or credit any overpayment to Deposit Account No. <u>19-4516</u>. A duplicate copy of this sheet is enclosed.</p> <p><input checked="" type="checkbox"/> A check in the amount of \$ <u>942.00</u> to cover the filing / additional fee is enclosed.</p> <p><input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.</p> <p style="text-align: center;">WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.</p>								
11/10/00				 Signature of Applicant, Attorney or Agent of Record Richard J. Basile Typed or printed name				
Date								

Attachment to Reissue Patent Application Transmittal:

Accompanying Application Parts, 14. Other:

- 1) Declaration Of European Counsel Filed With Reissue Application
- 2) Declaration Of U.S. Counsel Filed With Reissue Application
- 3) Second Supplemental Reissue Declaration Of Lars Severinsson
- 4) Supplemental Reissue Declaration Of Lars Severinsson
- 5) Letter Requesting Transfer of Drawings In Reissue Application (37 CFR 1.174)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	Lars Severinsson
Serial No. Pending	Filing Date: November 10, 2000
Title of Application	Disc Brake Caliper

Box Reissue
Assistant Commissioner for Patents
Washington, DC 20231


Preliminary Amendment

Dear Sir:

This Preliminary Amendment is being filed in connection with a Continuation Application for copending Reissue Patent Application Serial No. 09/324,506, filed herewith. Please enter this Preliminary Amendment before calculating the filing fees for accompanying application.

Mailing Certificate: I hereby certify that this correspondence is today being deposited with the U.S. Postal Service as *Express Mail Post Office to Addressee* Mailing Label Number EL570204551US in an envelope addressed to: Box Reissue; Assistant Commissioner for Patents; Washington, DC 20231.

November 10, 2000


Beatrice R. Emerson

Amendment

In the Specification

At column 1, before "Technical Field", please add the following:

--Related Applications

This is a continuation of copending Reissue Patent Application Serial No. 09/324,506, filed June 3, 1999, which is a reissue of U.S. Patent No. 5,833,035, issued November 10, 1998. --

In the Claims

Please cancel Claims 1-24 and add the following new claims:

25. A disc brake caliper system comprising a housing (1) to be arranged astraddle of a vehicle brake disc, two thrust sleeves (8), which are connected to a brake pad holder (6) provided with a brake pad (5) for braking engagement with the brake disc and which are axially movable in the housing at a distance from each other, a cross bar (9) connecting the two thrust sleeves, and a lever (17) for transmitting a brake force from a brake cylinder (4) attached to the housing, to the cross bar, characterized in that the mechanism including the thrust sleeves (8), the cross bar (9) and the lever (17) is a self-sustained unit for insertion in the housing (1) and further characterized in that bearing tappets (20), parallel with the cross

bar (9), are fixedly connected to the inside of the housing (1) and in that the lever (17), besides an arm (18) for actuation by the brake cylinder (4), comprises a curved wedge (19), having an inner cylindrical surface (19') in engagement with outer cylindrical surfaces of the bearing tappets and an outer cylindrical surface (19'') -- with greater radius than the inner cylindrical surface -- in engagement with an inner cylindrical surface of the cross bar.

26. A mechanism according to Claim 25, characterized in that an adjuster mechanism (28) is arranged on a splined shaft (29) rotatably journaled in the bearing tappets (20).

27. A mechanism according to Claim 26, characterized in that the adjuster mechanism (28) is arranged between the two bearing tappets (20).

28. A mechanism according to Claim 27, characterized in that an adjuster housing (33) of the adjuster mechanism (28) is provided with external gears in engagement with a gear wheel (41) rotatably journaled in the housing (1), the gear wheel (41) in turn being in engagement with an internal gear segment (17'') in an arcuate yoke (17') of the lever (17).

Remarks

In an Office Action mailed on February 15, 2000 during prosecution of the parent to the present application, Examiner Chris Schwartz rejected amended claim 16 of the parent application, which is identical to claim 25 above, under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,433,298 to Antony et al. Applicant filed a Response on April 12, 2000, requesting that the Examiner reconsider his position and highlighting the novel aspects of the invention over the cited prior art. Thereafter, Examiner Schwartz telephoned Applicant's attorney, Todd Oberdick, to inform him that although Examiner Schwartz had determined that Claim 16 was patentable over the references of record, and had attempted to issue a Notice of Allowability, a reissue supervisor at the U.S. Patent Office had instructed Examiner Schwartz not to issue the Notice of Allowability, and instead reject Claim 16 under the theory of impermissible recapture. In response to this telephone conversation, Applicant amended Claim 16 to remove any question of recapture so as not to delay the issuance of the parent application. Applicant now files the present application, with the above Claim 25 being identical to Claim 16 of the parent case before having been amended to remove any question of recapture.

For the foregoing reasons, Applicant respectfully submits that any questions of patentability with respect to the prior art have already been resolved, and that the only issue presented in this case relate to the recapture allegation.

During the telephone call described above, the Examiner objected to Claim 16 (now Claim 25 of the present application) on the grounds that it had been amended in a manner which resulted in the impermissible recapture of surrendered subject matter. More specifically, the claim had been amended so as to not require cover (2). Applicant respectfully disagrees that recapture exists.

It is well known that a reissue will not be granted to "recapture" claimed subject matter which was surrendered in an application to obtain the original patent. However, Applicant respectfully submits that such is not occurring here.

In the parent application, there were two sets of claims. Claims 1-12 were directed to a modular disc brake system having a housing (1), a cover (2), and a plurality of other components carried by the cover (2) independently of the housing. Claim 13, which was added later during prosecution, was directed to a disc brake system having a particular wedge configuration. Unfortunately, Claim 13 also recited a cover (2) in addition to a housing (1).

Therefore, the two sets of claims related to two completely different points of novelty: the first set of claims (Claims 1-12) related to the modular configuration, while the second set of claims (Claim 13) related to the wedge configuration. Moreover, while the cover (2) was required for the first set of claims, and arguments were made to this effect during prosecution of the parent application, the cover (2) was not required for patentability for the second set of claims, and no arguments were made for patentability of Claim 13 based upon the presence of the cover (2). The inclusion of the cover (2) in Claim 13 was erroneous, and in fact constitutes one of the bases for the reissue application (See Second Supplemental Reissue Declaration Of Lars Severinsson, Para. 5).

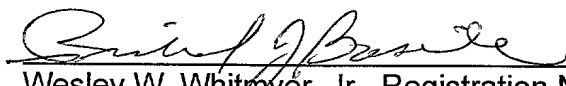
Applicant is now attempting to remedy the erroneous inclusion of the cover (2) in the claims relating to the wedge configuration. This is not recapture, as no argument was made during prosecution of the parent that the cover (2) was necessary for patentability of the claims directed to the wedge configuration. The only arguments which were made regarding the cover (2) concerned the claims directed to the modular configuration. As such, Applicant never surrendered a claim directed to the wedge configuration without a cover (2), and there can be no recapture of such a claim. It is now, and has always been, Applicant's position

Applicant: Lars Severinsson
Filed: November 10, 2000
Page 7

that the wedge configuration alone is patentable over the prior art regardless of whether or not the system includes a cover (2), and the Examiner apparently agreed by his indication that a Notice of Allowance would have issued absent the issue of recapture.

For the foregoing reasons, Applicant respectfully submits that Claims 25-28 are patentable over the references of record and earnestly solicits allowance of the same.

Respectfully submitted,



Wesley W. Whitmyer, Jr., Registration No. 33,558
Richard J. Basile, Registration No. 40,501
Todd M. Oberdick, Registration No. 44,268
Attorneys for Applicant
ST. ONGE STEWARD JOHNSTON & REENS LLC
986 Bedford Street
Stamford, CT 06905-5619
203 324-6155

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Reissue application of:

Inventor: Lars Severinsson

Patent No.: 5,833,035

Granted: Nov. 10, 1998

THE REISSUE SPECIFICATION

DISC BRAKE CALIPER

TECHNICAL FIELD

This invention relates to a disc brake caliper, comprising a housing to be arranged astraddle of a vehicle brake disc, a cover attached to the housing, two thrust sleeves, which are connected to a brake pad holder provided with a brake pad for braking engagement with a brake disc and which are axially movable in the housing at a distance from each other, a cross bar connecting the two thrust sleeves, and a lever for transmitting a brake force from a brake cylinder, attached to the caliper, to a cross bar.

A disc brake caliper of this kind is primarily intended for a road vehicle but may quite as well be used for a rail vehicle.

TECHNICAL BACKGROUND

Prior designs for disc brake calipers of this kind are for example shown in EP-A-0 569 031 and EP-B-0 291 071. In both these designs the force transmission from the lever to the cross bar is rather complex. This means that these disc brake calipers are comparatively expensive and vulnerable.

THE INVENTION

A less complex, cheaper and more reliable design is according to the invention attained in that bearing tappets, parallel with the cross bar, are fixedly connected to the inside of the cover and in that the lever, besides an arm for actuation by the brake cylinder, comprises a curved wedge, having an inner cylindrical surface in engagement with outer cylindrical surfaces of the bearing tappets and an outer cylindrical surface—with greater radius than the inner cylindrical surface—in engagement with an inner cylindrical surface in the cross bar.

In a way known per se needle bearings are preferably arranged between on one hand the inner cylindrical surface of the curved wedge and the outer cylindrical surfaces of the bearing tappets and on the other hand the outer cylindrical surface of the curved wedge and the inner cylindrical surface in the cross bar.

An adjuster mechanism, necessary in a disc brake caliper of this kind, may be arranged in different places, and typical examples of this can be found in the two earlier mentioned patent publications.

According to the present invention an adjuster mechanism is arranged on a splined shaft rotatably journaled in the bearing tappets. Accordingly, the adjuster mechanism is arranged in a stationary part of the caliper with the advantages associated therewith.

Preferably the adjuster mechanism is hereby arranged between the two bearing tappets.

The adjuster mechanism used in the present disc brake caliper comprises an adjuster housing, an adjustment spring with its outer periphery in engagement with an inner surface of the adjuster housing, a driving ring connected to the adjustment spring by means of a radial extension thereof in a driving ring recess, an adjuster hub connected to the splined shaft by means of inner splines, and a one-way spring connected to the driving ring by means of a radial extension and arranged on coaxial cylindrical surfaces of the driving ring and the adjuster hub.

The adjuster housing is preferably connected to the inner cylindrical surface of the curved wedge by a pin or the like extending from the surface into a housing groove.

Hereby the control distance or A-measure for the adjuster is formed either in that the pin has a smaller diameter than the circumferential dimension of the groove or in that the adjuster spring extension has a smaller circumferential dimension than the driving ring recess.

According to a modified embodiment the adjuster housing is provided with external gears in engagement with a gear wheel rotatably journaled in the cover, the gear wheel in turn being in engagement with an internal gear segment in an arcuate yoke of the lever. By this design it is possible to obtain a higher exchange ratio and thus a faster takeup of excessive slack.

In this adjuster mechanism the control distance or A-measure for the adjuster is formed in that the adjuster spring extension has a smaller circumferential dimension than the driving ring recess.

In both these adjuster designs each end of the splined shaft is connected to an adjustment shaft in internal splines connection with the thrust sleeve by means of bevel gears, the thrust sleeve being rotationally connected to the brake pad holder and in thread connection with the cross bar.

The cover and the cross bar may according to the invention be resiliently connected by means of screws extending through holes in the cross bar and attached to the cover, a compression spring being arranged between the head of each screw and a spring sleeve bearing against the cross bar.

By this design a return force for the cross bar and accordingly for the thrust sleeves is obtained, but the cover and the rest of the mechanism are also held together as a unit even in the absence of the housing, which accordingly may be manufactured separately.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described in further detail below reference being made to the accompanying drawings, in which

FIG. 1 is a section of a disc brake caliper according to the invention (along the lines I—I in FIG. 2),

FIG. 2 is a section of the caliper along the line II—II in FIG. 1.

FIG. 3 is a plan view of a lever in the caliper according to the invention.

FIG. 4 is a side view of the above lever,

FIG. 5 is a plan view (in two levels) of a sub assembly of the caliper according to the invention, including the lever shown in FIGS. 3 and 4.

FIG. 6 is an enlargement of the central part of FIG. 2 for more clearly illustrating the adjuster part of the caliper.

FIG. 7 is a plan view, partly in section, of an adjuster housing with its contents.

FIG. 8 is a sectional side view corresponding to FIG. 1 but to a larger scale and showing a modified embodiment, and

FIG. 9 is a section corresponding to FIG. 6 of the modified embodiment of FIG. 8.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

A disc brake caliper, preferably for use in heavy road vehicles, is shown in FIGS. 1 and 2. As is well known in the art, a caliper of this kind is to be mounted in a vehicle underframe astraddle of a brake disc (not shown) on a rotating axle of the vehicle.

The main components of the disc brake caliper are a housing 1 and a cover 2, which are attached to each other by

means of screws 3. Attached to the cover 2 is a brake cylinder 4, normally a pneumatic brake cylinder, for delivering a brake force to the caliper. The brake cylinder 4 is only indicated in FIG. 1 with dash dotted lines.

In a way to be described the brake force from the brake cylinder 4 is transmitted to a brake pad 5 engaging the brake disc (not shown). The reaction force at braking is taken up by a similar brake pad (not shown) attached to the housing 1 at the other side of the brake disc (not shown), as is well known in the art.

The brake pad 5 is attached to a pad holder 6, which in turn—via a heat shield 7—is attached to two thrust plates 81. Rotationally attached to these thrust plates 81 are thrust sleeves 8, which thus are axially and rotationally movable in the housing 1. The two thrust sleeves 8 are provided with external threads, and a cross bar 9, having two internally threaded bores 10 (FIG. 5), is attached to these thrust sleeves 8; the three parts 8 and 9 form a brake force transmitting unit. The cross bar 9 is provided with a projection 9' engaging a corresponding recess in the housing 1 for the guiding of the cross bar 9.

Hold-off or return springs 11 are arranged between the housing 1 or rather the cover 2 and the cross bar 9 in the following way. The cross bar 9 is provided with bores 12 at its two ends. Screws 13 surrounded by the springs 11 pass freely through these holes 12. The screws 13 are attached in corresponding holes in the cover 2. Each spring 11 is arranged between the head of the screw 13 and the bottom end of a spring sleeve 14 which bears against the shoulder on the cross bar 9 with its other end. By the described hold-off spring arrangement delivery of the mechanism as a unit including the hold-off springs is possible, in spite of the fact that the hold-off force acts between the cross bar 9 and the housing 1. The arrangement will act to hold the cover 2 and the rest of the mechanism together also in the absence of the housing 1.

A protective bellows 15 is arranged between each thrust plate 81 and the housing 1 for preventing contaminants to enter into the mechanism inside the housing 1. Each bellows 15 is attached to the thrust plate 81 at the manufacture of the mechanism, whereas the attachment thereof to the housing 1 at the later mounting at the vehicle manufacturer can occur by means of a cup 16 pressed in place by the thrust plate 81.

The brake force from the piston rod (not shown) of the brake cylinder 4 is transmitted to the mechanism, especially the cross bar 9, by means of a lever 17. The lever 17 consists in essence of an arm 18 extending out from what could be called a curved wedge 19 having cylindrical surfaces in engagement with corresponding cylindrical surfaces of the cross bar 9 and bearing tappets 20. Each of these bearing tappets 20 rests by means of a bevel on the cover 2 and is connected thereto by means of a pin 21, so that it can be regarded as a part of the cover 2.

As will appear below there are two bearing tappets 20, and an adjuster mechanism 28 is arranged between them.

An inner cylindrical surface 19' of the curved wedge 19 cooperates with the bearing tappets 20, whereas an outer cylindrical surface 19" with larger radius than the inner cylindrical surface 19' cooperates with the cross bar 9. The centers for these two cylindrical surfaces 19' and 19" are offset in relation to each other, as appears especially well in FIG. 4, where the center for the outer cylindrical surface 19" is higher than that of the inner cylindrical surface 19'.

Inner needle bearings 22 with inner roller cages 23 are arranged between the inner cylindrical surface 19' and the bearing tappets 20. In a similar manner outer needle bearings

24 with outer roller cages 25 are arranged between the outer cylindrical surface 19" and the cross bar 9. Each outer roller cage 25 is held in a hardened insert 25' held in place by a pin 25" in the cross bar 9 (FIGS. 5 and 6). The purpose of these
 5 needle bearings is to enable a high efficiency for the engagement between the curved wedge 19 and the curved surfaces cooperating therewith.

When the lever 17 moves from its position to the right in FIG. 1, drawn with full lines, to its position to the left in FIG. 1, drawn with dashed lines, the curved wedge 19 will be
 10 forced in between the bearing tappets 20 and the cross bar 9 and push the latter to the left in the drawing, accomplishing a brake application via the thrust sleeves 8. For axial guidance the lever 17 is provided with an outer ridge 26
 15 between the two inserts 25'. Further, there are lower pins 27 in the inner cylindrical surface 19' and the outer cylindrical surface 19", respectively, for circumferential guidance of the roller cages 23 and 25, respectively.

The adjuster function of the disc brake caliper according to the invention will now be described. The adjuster mechanism 28 is arranged between the bearing tappets 20 and is
 20 most clearly shown in FIGS. 6 and 7. However, the general arrangement will first be described with reference to FIG. 2.

The adjuster mechanism 28 to be described is arranged on a splined shaft 29, which extends through the adjuster
 25 mechanism 28 and freely through the bearing tappets 20. Either end of the splined shaft 29 is provided with a bevel gear 30 meshing with a corresponding bevel gear 31 on a splined adjustment shaft 32 in engagement with internal splines in each thrust sleeve 8. By turning the splined shaft
 30 29 by means of the adjuster mechanism 28 in a way to be described below, the adjustment shafts 32 will be synchronously turned for turning the thrust sleeves 8 in the cross bar 9 and moving them forward in order to compensate for wear
 35 of the the brake pad 5.

As most clearly appears from FIG. 7, the adjuster mechanism 28 has an adjuster housing 33. This adjuster housing 33 is arranged between the two bearing tappets 20 and also in
 40 a suitable recess in the cover 2, as appears from FIG. 6. The adjuster housing is provided with a key groove 33' for a pin 34 (FIG. 6) attached in the curved wedge 19 and constituting a means for transferring motions to the adjuster housing 33.

The adjuster housing 33 contains the following elements
 45 to be further described: an adjustment spring 35, a guiding sleeve 36, a one-way spring 37, a driving ring 38, an adjuster hub 39 and a locking ring 40 in the end of the adjuster housing 33 for keeping all the other parts together in the housing.

The adjustment spring or friction spring 35 has an outer diameter which is slightly larger than the inner diameter of the housing 33 and is in friction engagement therewith. At one end it is provided with a radial extension 35' engaging a corresponding recess 38' of the driving ring 38. A control
 55 distance or A-measure for the adjuster can be formed either in that the groove 33' has a greater circumferential dimension than the diameter of the pin 34 or that the recess 38' in the driving ring 38 has a greater circumferential dimension than the adjustment spring extension 35'. A radial extension
 60 of the one-way spring or locking spring 37 is attached to the driving ring 38, and two or three turns of this spring may be in firm engagement with the driving ring for providing assistance to the force transmission, whereas the remaining turns of the spring 37 may engage the adjuster hub 39 at
 65 mutual rotation in one direction, the driving direction. The purpose of the guiding sleeve 36 between the two springs 35 and 37 is to guide them and thus to assist in obtaining an

accurate clutch function. The adjuster hub 39 is in splines engagement with the splined shaft 29 (FIG. 6).

During an application stroke, i.e. when the lever 17 is moved to the left in FIG. 1 by the brake cylinder 4 and the curved wedge 19 is pushing the cross bar 9 (and associated parts) to the left in FIG. 1, the control distance or A-measure defined in either of the two places mentioned above will first be traversed. At the continued application stroke the adjustment spring 35 will be in engagement with the housing 33 by means of friction forces and will turn the thrust sleeves 8 for slack decreasing, if the slack between the brake pad and the brake disc is excessive in relation to the set control distance, until a counter-force and thus a torque is built up, when the brake pad engages the brake disc. The force transmission during adjustment occurs by means of the one-way spring 35 drivingly acting between the driving ring 38 and the adjuster hub 39. When the brake pad is in engagement with the brake disc, the torque is such that slip will occur between the housing 33 and the adjustment spring 35.

During the release stroke no torque is transmitted by the one-way spring 37 between the driving ring 38 and the adjuster hub 39. If the slack between the brake pads and the brake disc was excessive and a portion of this excessive slack has been taken up by a small rotation of the thrust sleeve 8 in relation to the cross bar 9, this new relative position will be maintained during the release stroke.

A modified design for the adjuster mechanism is shown in FIGS. 8 and 9. These figures are only provided with reference numerals for parts that are referred to below and/or are different in relation to the first embodiment, shown in the previous figures.

In this embodiment according to FIGS. 8 and 9 the movement from the curved wedge 19 to the adjuster housing 33 is not performed in the same way as in the previous embodiment. Instead the lever 17 is provided with an arcuate yoke 17' having an internal, cylindrical gear segment 17" concentric with the bearing tappets 20. The housing 33 is provided with external gears, and a gear wheel 41 meshing with the gear segment 17" and with the adjuster housing 33 is rotatably journaled in the cover 2. For obtaining the desired result with this modified embodiment the contents of the adjuster housing 33 can be the same as in the first embodiment but reversed.

By this design it is possible to obtain a higher exchange ratio and thus a faster take-up of excessive slack.

I claim:

1. An interconnected disc brake caliper assembly ready for attachment to a brake cylinder (4), comprising in combination: a housing for straddling a vehicle brake disc, a cover (2) attached to the housing substantially parallel to the brake disc which further comprises two thrust sleeves (8), which are connectable to a brake pad holder (6) provided with a brake pad (5) for braking engagement with the brake disc and which sleeves are axially movable and arranged on the cover for disposal in the housing at a distance from each other, a cross bar (9) encompassing the two thrust sleeves, and a lever (17) for transmitting a brake force from a brake cylinder (4) to said crossbar, bearing tappets (20) arranged parallel with the cross bar (9) fixedly connected to the inside of the cover (2) and wherein the lever (17) comprises an arm (18) for actuation by the brake cylinder (4) and a curved wedge (19) having an inner cylindrical surface (19') in engagement with outer cylindrical surfaces of the bearing tappets and an outer cylindrical surface (19'') with greater radius than the inner cylindrical surface in engagement with an inwardly directed cylindrical surface in the cross bar.

2. A disc brake caliper according to claim 1, characterized in that an adjuster mechanism (28) is arranged on a splined shaft (29) rotatably journaled in the bearing tappets (20).

3. A disc brake caliper according to claim 2, characterized in that the adjuster mechanism (28) is arranged between the two bearing tappets (20).

4. A disc brake caliper according to claim 1, characterized in that needle bearings (22, 24) are arranged between the inner cylindrical surface (19') of the curved wedge (19) and the outer cylindrical surfaces of the bearing tappets (20) and the outer cylindrical surface (19'') of the curved wedge and the inner cylindrical surface in the cross bar (9).

5. A disc brake caliper according to claim 1, characterized in that the cover (2) and the cross bar (9) are resiliently connected by means of screws (13) extending through holes (12) in the cross bar and attached to the cover, a compression spring (11) being arranged between the head of each screw and a spring sleeve (14) bearing against the cross bar.

6. A disc brake caliper, comprising a housing (1) to be arranged astraddle of a vehicle brake disc, a cover (2) connected to the housing, two thrust sleeves (8) which are connected to a brake pad holder (6) provided with a brake pad (5) for braking engagement with the brake disc, said pad holder and brake pad being axially movable in the housing at a distance from each other, a cross bar (9) connecting the two thrust sleeves, and a lever (17) for transmitting a brake force to the cross bar from a brake cylinder (4) when attached to the caliper, characterized in that bearing tappets (20) arranged parallel with the cross bar (9) are fixedly connected to the inside of the cover (2) and in that the lever (17) comprises an arm (18) for actuation by the brake cylinder (4) and a curved wedge (19) having an inner cylindrical surface (19') in engagement with outer cylindrical surfaces of the bearing tappets and an outer cylindrical surface (19'') with greater radius than the inner cylindrical surface in engagement with an inner cylindrical surface in the cross bar, wherein an adjuster mechanism (28) comprises an adjuster housing (33), an adjustment spring (35) with its outer periphery in engagement with an inner surface of the adjuster housing, a driving ring (38) connected to the adjustment spring by means of a radial extension (35') thereof in a driving ring recess (38'), an adjuster hub (39) connected to the splined shaft (29) by means of inner splines, and a one-way spring (37) connected to the driving ring by means of a radial extension and arranged on coaxial cylindrical surfaces of the driving ring and the adjuster hub.

7. A disc brake caliper according to claim 6, characterized in that the adjuster housing (33) is provided with external gears in engagement with a gear wheel (41) rotatably journaled in the cover (2), the gear wheel (41) in turn being in engagement with an internal gear segment (17'') in an arcuate yoke (17') of the lever (17).

8. A disc brake caliper according to claim 7, characterized in that a control distance A for the adjuster is formed in that the adjuster spring extension (35') has a smaller circumferential dimension than a said driving ring recess (38').

9. A disc brake caliper according to claim 6, characterized in that the adjuster housing (33) is connected to the inner cylindrical surface (19') of the curved wedge (19) by a pin (34) extending from the surface into a housing groove (33').

10. A disc brake caliper according to claim 6, characterized in that a control distance A for the adjuster is established in that a pin (34) has a smaller diameter than a circumferential dimension of a groove (33') in said housing.

11. A disc brake caliper according to claim 6, characterized in that a control distance A for the adjuster is established by the adjuster spring extension (35') having a smaller circumferential dimension than said driving ring recess (38').

12. A disc brake caliper, comprising in combination, a housing (1) to be attached to a vehicle brake disc assembly, a cover (2) for said housing adapted to contact a brake pad holder (6) provided with a brake pad (5) for braking engagement with the brake disc, said pad holder and brake pad being axially movable in the housing during braking strokes, a cross bar (9) axially movable with said pad holder and brake pad carrying two thrust sleeves, a rotatable lever (17) for transmitting a brake force to the cross bar from a brake cylinder (4), bearing tappets (20) fixedly connected to the inside of the cover (2) having outer cylindrical surfaces for supporting the rotation of said lever (17), a curved wedge (19) carried by the lever for axially moving the cross bar in

a braking operation, said lever (17) further having an inner cylindrical surface (19') in engagement with outer cylindrical surfaces of the bearing tappets and an outer cylindrical surface (19'') with greater radius than the inner cylindrical surface in engagement with a mating cylindrical surface of the cross bar, and needle bearings affixed adjacent to the respective inner and outer cylindrical surfaces of the lever (17) to reduce friction between the inner and outer cylindrical surfaces of the lever (17) and the respective tappets (20) and the cylindrical surface of the cross bar.

13. A brake application mechanism for a disc brake caliper, the caliper comprising a housing (1) to be arranged astraddle of a vehicle brake disc, a cover (2) attached to the housing, two thrust sleeves (8), which are connected to a brake pad holder (6) provided with a brake pad (5) for braking engagement with the brake disc and which are axially movable in the housing at a distance from each other, a cross bar (9) connecting the two thrust sleeves, and a lever (17) for transmitting a brake force from a brake cylinder (4), attached to the caliper, to the cross bar, characterized in that the mechanism including the thrust sleeves (8), the cross bar (9) and the lever (17) is a self-sustained unit for insertion in the housing (1).

14. A mechanism according to Claim 13, characterized in that the unit includes the cover (2).

15. A mechanism according to Claim 14, characterized in that the cover (2) and the cross bar (9) are resiliently connected by means of screws (13) extending through holes (12) in the cross bar and attached to the cover, a compression spring (11) being arranged between the head of each screw and a spring sleeve (14) bearing against the cross bar.

16. A mechanism according to Claim 13, characterized in that bearing tappets (20), parallel with the cross bar (9), are fixedly connected to the inside of the cover (2) and in that the lever (17), besides an arm (18) for actuation by the brake cylinder (4), comprises a curved wedge (19), having an inner cylindrical surface (19') in engagement with outer cylindrical surfaces of the bearing tappets and an outer cylindrical surface (19'') - with greater radius than the inner cylindrical surface - in engagement with an inner cylindrical surface in the cross bar.

17. A mechanism according to Claim 13, characterized in that an adjuster mechanism (28) is arranged on a splined shaft (29) rotatably journalled in the bearing tappets (20).

18. A mechanism according to Claim 17, characterized in that the adjuster mechanism (28) is arranged between the two bearing tappets (20).

19. A mechanism according to Claim 18, characterized in that an adjuster housing (33) of the adjuster mechanism (28) is provided with external gears in engagement with a gear wheel (41) rotatably journaled in the cover (2), the gear wheel (41) in turn being in engagement with an internal gear segment (17'') in an arcuate yoke (17') of the lever (17).

20. A mechanism according to Claim 17, characterized in that each end of the splined shaft (29) is connected to an adjustment shaft (35) in internal splines connection with the thrust sleeve (8) by means of bevel gears (30, 31) and in that the thrust sleeve is rotationally connected to the brake pad holder (6) and is in thread connection with the cross bar (9).

21. A brake application mechanism, comprising in combination, a first modular unit comprising a housing and cover for receiving a brake application mechanism adapted to be disposed between a brake cylinder and a braking pad, and

a second modular unit for insertion into said first said modular unit held together as an independent self sustained unit comprising a brake application mechanism with a brake force transmitting lever for transmitting braking forces from the brake cylinder to the braking pad.

22. The mechanism defined in Claim 21, further comprising: two thrust sleeves which are connectable to a brake pad holder provided with a brake pad for braking engagement with a brake disc and which sleeves are axially movable and arranged on the cover for disposal in the housing at a distance from each other, a cross bar in the brake application mechanism unit has bores for receiving the thrust sleeves, and corresponding adjustment shafts extending through the thrust sleeves to transmit braking forces.

23. The mechanism defined in Claim 21, further comprising: attachment means comprising spring biased screws arranged between the cover in the first modular unit and the brake application mechanism in the second modular unit to bear against the brake application mechanism for holding the cover and brake application mechanism together as a unit for insertion into said housing.

24. The mechanism defined in Claim 23, further comprising a brake disc caliper brake application mechanism to be arranged astraddle of a vehicle brake disc.

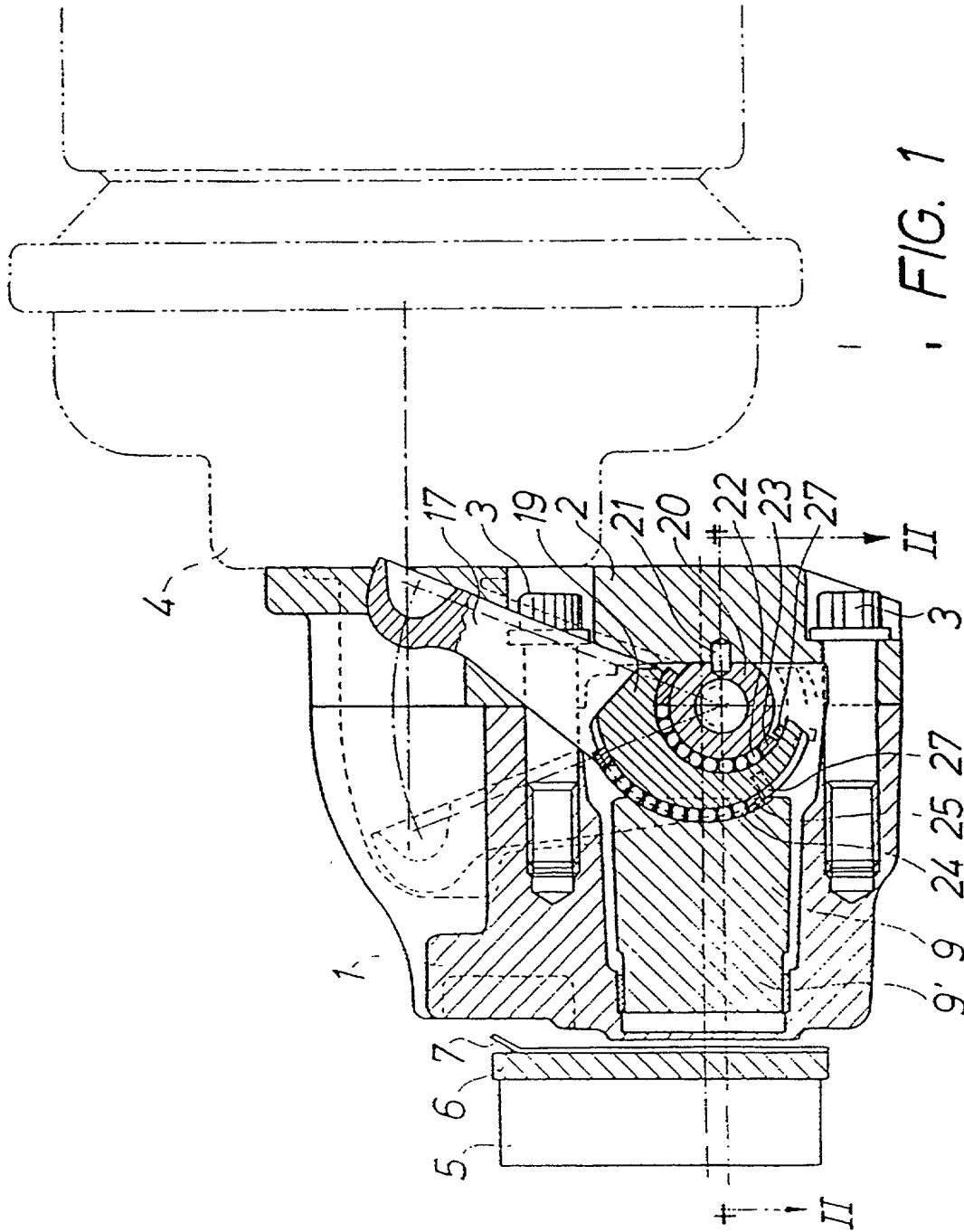


FIG. 1

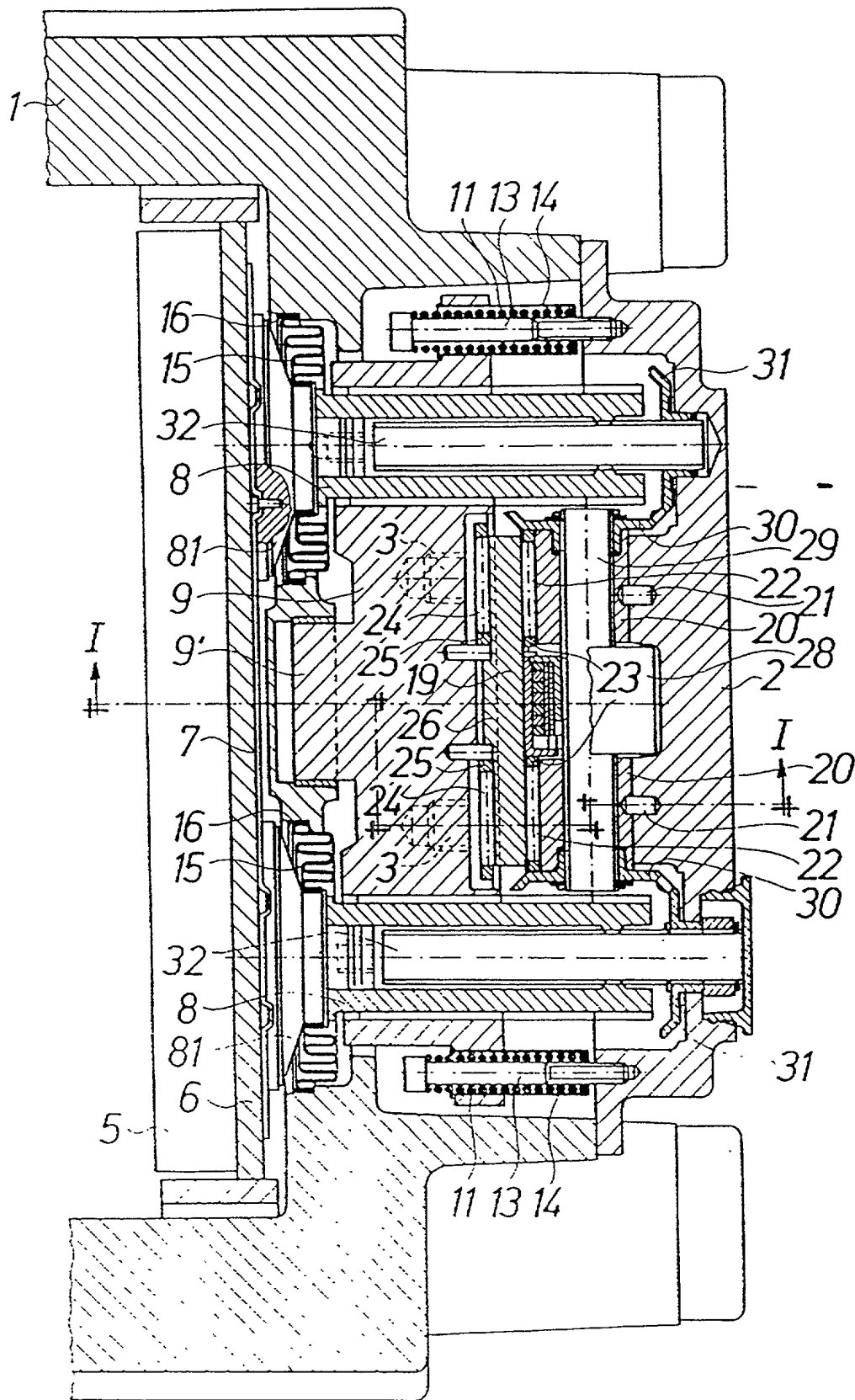


FIG. 2

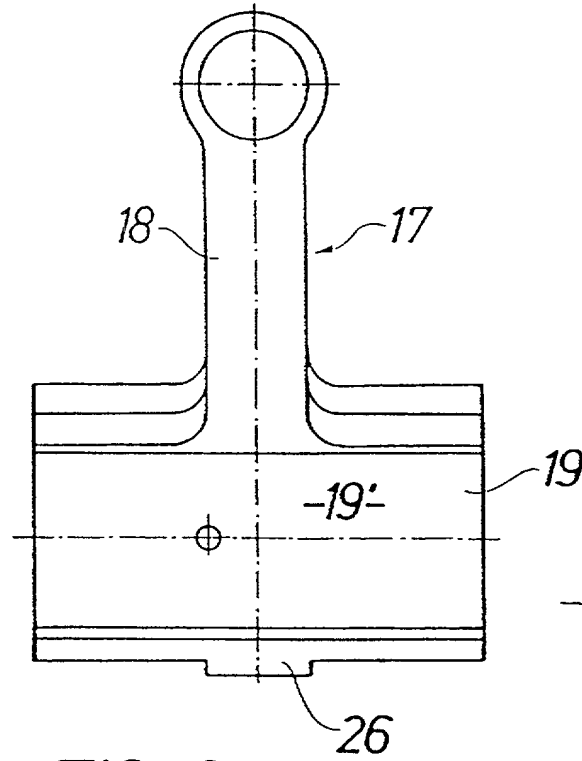


FIG. 3

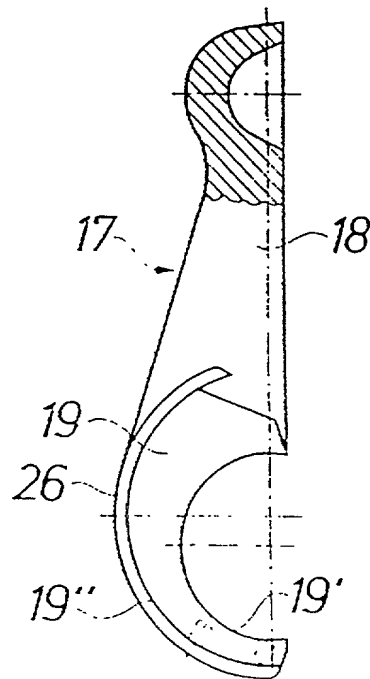
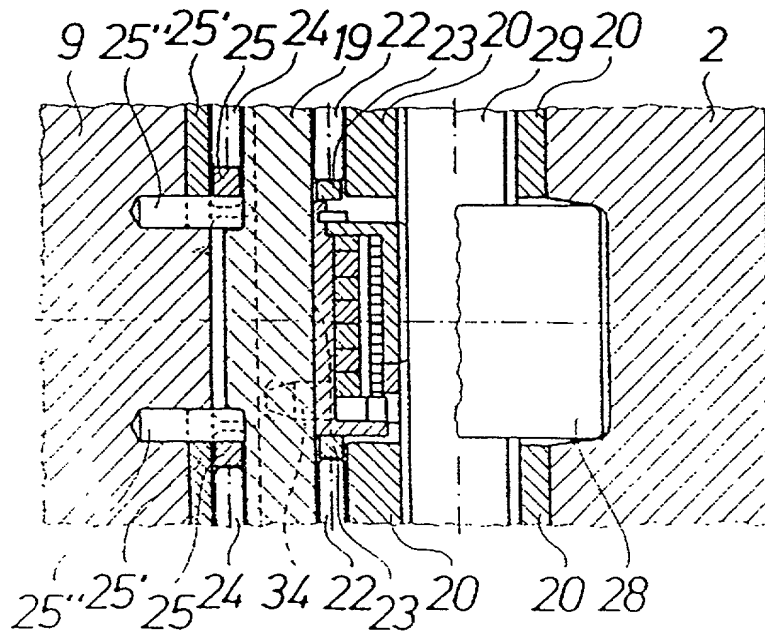
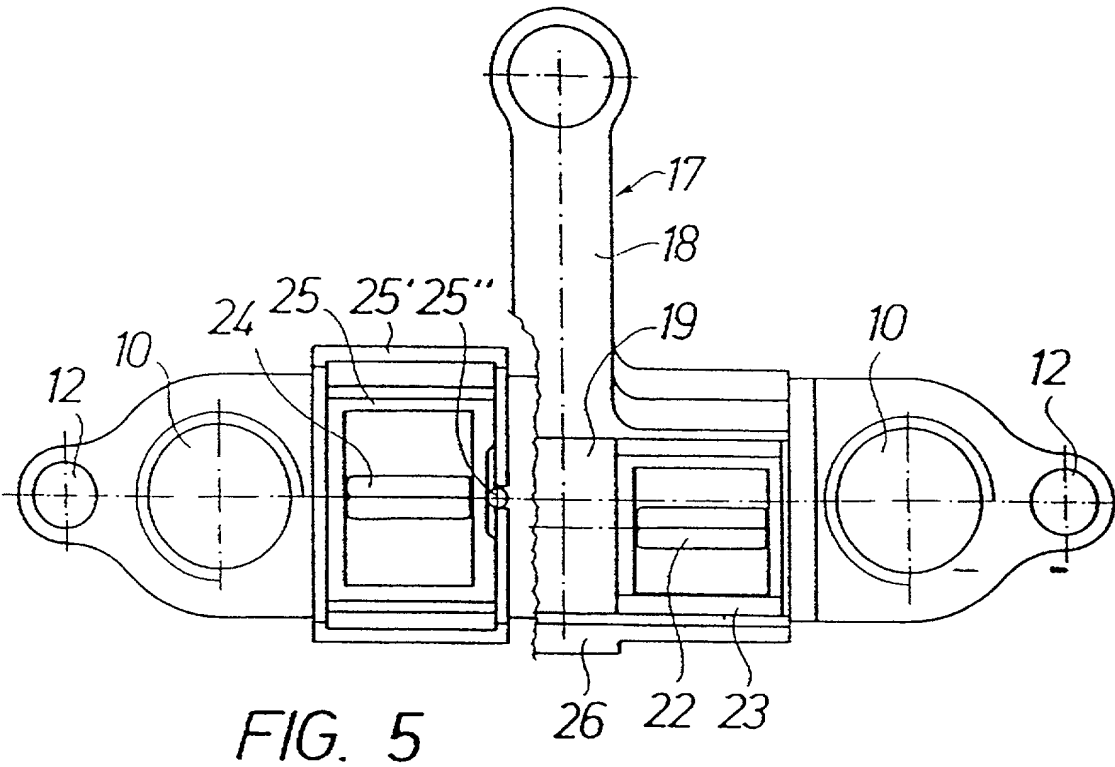


FIG. 4



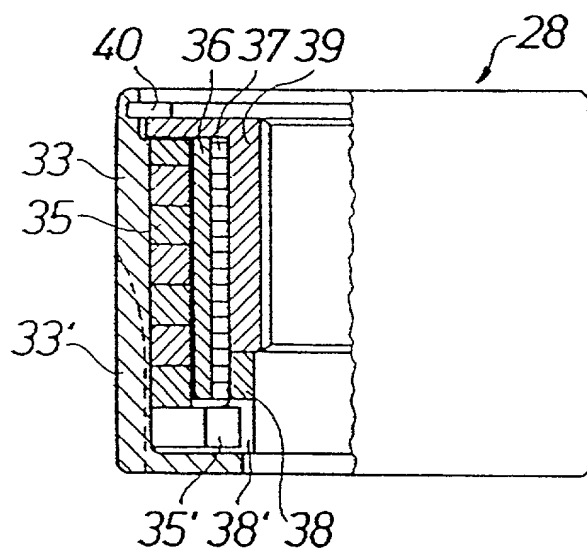


FIG. 7

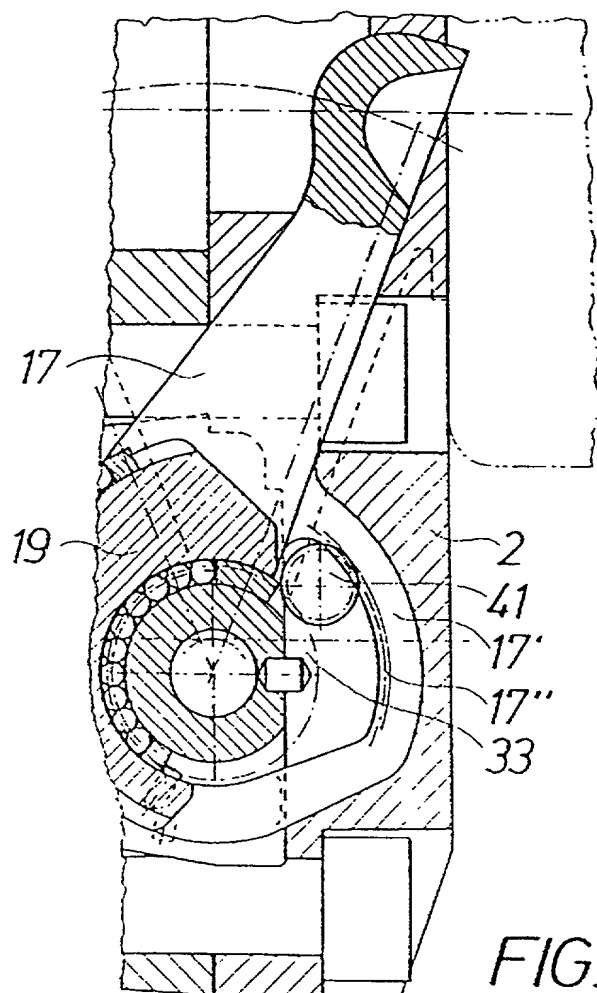


FIG. 8

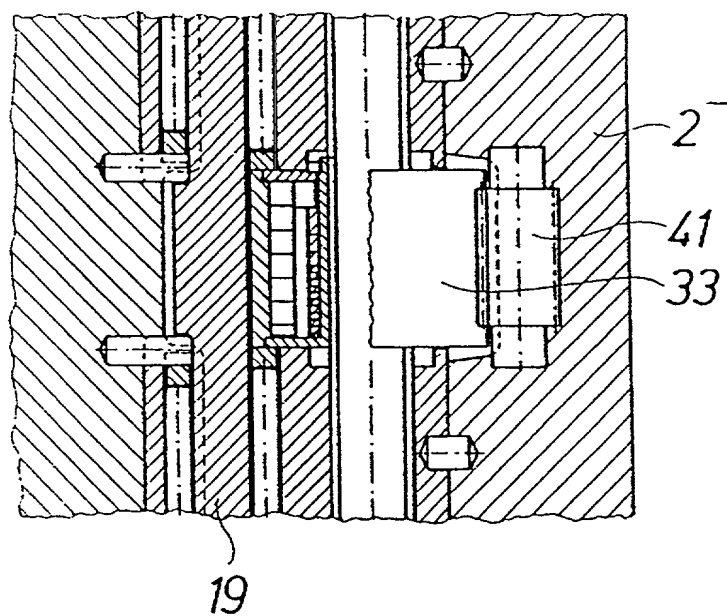


FIG. 9

Please type a plus sign (+) inside this box → ☐

PTO/SB/01 (12-97)
Approved for use through 9/30/00. OMB 0651-0032
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

**DECLARATION FOR UTILITY OR
DESIGN
PATENT APPLICATION
(37 CFR 1.63)**

☒ Declaration
Submitted with Initial
Filing OR ☐ Declaration
Submitted after Initial
Filing (surcharge
(37 CFR 1.16 (e))
required)

Attorney Docket Number 6213RE

First Named Inventor Lars Severinsson

COMPLETE IF KNOWN

Application Number /

Filing Date

Group Art Unit

Examiner Name

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

DISC BRAKE CALIPER

the specification of which

(Title of the Invention)

☒ is attached hereto
OR

☐ was filed on (MM/DD/YYYY) as United States Application Number or PCT International

Application Number and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)	<input type="checkbox"/> Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

[Page 1 of 2]

Burden Hour Statement: This form is estimated to take 0.4 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Please type a plus sign (+) inside this box → ☐

PTO/SB/01 (12-97)
Approved for use through 9/30/00. OMB 0651-0032

Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

DECLARATION — Utility or Design Patent Application

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)
08/817,769	April 24, 1997	5,833,035

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

☐ Customer Number

OR

☒ Registered practitioner(s) name/registration number listed below

Place Customer Number Bar Code Label here

Name	Registration Number	Name	Registration Number
LAURENCE R. BROWN	16,486		

☐ Additional registered practitioner(s) named on supplemental Registered Practitioner Information sheet PTO/SB/02C attached hereto.

Direct all correspondence to: ☐ Customer Number or Bar Code Label ☒ Correspondence address below

Name	Laurence R. Brown				
Address	2001 Jefferson Davis Highway				
Address	Suite 408				
City	Arlington	State	VA	ZIP	22202
Country	United States	Telephone	(703)415-4660	Fax	(703)415-4664

REISSUE DECLARATION CLAUSES UNDER 37 CFR 1.175

Applicant believes the original patent to be partly inoperative or invalid by reason of the patentee claiming less than patentee had the right to claim in the patent.

The defective, inoperative or invalid patent arose through error without deceptive intent in that the true scope of the invention disclosed in the patent was not fully appreciated by the applicant or his attorneys until recent thorough review and study of the claim coverage revealed the error of patentee claiming less than he had a right to claim.

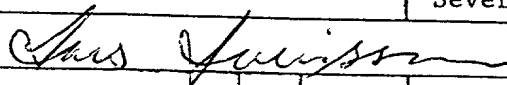
Please type a plus sign (+) inside this box → ☐

PTO/SB/01 (12-97)

Approved for use through 9/30/00. OMB 0651-0032
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

DECLARATION — Utility or Design Patent Application

Name of Sole or First Inventor:		<input type="checkbox"/> A petition has been filed for this unsigned inventor					
Given Name (first and middle [if any])				Family Name or Surname			
Lars				Severinsson			
Inventor's Signature						Date	
Residence: City	Hishult	State		Country	Sweden	Citizenship	Swedish
Post Office Address	Nordanavagan, S-310 21						
Post Office Address	Hishult			Sweden			
City		State		ZIP		Country	
<input type="checkbox"/> Additional inventors are being named on the supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto							

PATENT
01925-10128A WWW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Lars Severinsson	Assignee: Haldex Brake Products AB
Serial No. 09/324,506	Filing Date: June 3, 1999
Title of Application:	Disc Brake Caliper

Assistant Commissioner for Patents
Washington, DC 20231

Revocation and New Power Of Attorney

Dear Sir:


Haldex Brake Products AB, hereby revokes all previous powers of attorney and appoints the following attorneys to prosecute this patent and transact all business in the United States Patent and Trademark Office connected therewith, receive all communications from the United States Patent and Trademark Office, to receive the Letters Patent, and be its agent for service of process in connection herewith:

Wesley W. Whitmyer, Jr., Registration No. 33,558
Richard J. Basile, Registration No. 40,501
Attorneys for Applicant
ST. ONGE STEWARD JOHNSTON & REENS LLC
986 Bedford Street
Stamford, CT 06905-5619
203 324-6155

To the best of my knowledge, Haldex Brake Products AB is the assignee of record of the patent application identified above.

HALDEX BRAKE PRODUCTS AB

Dated: 028/3-00
March 28, 2000

By 
Name: Magnus Bergström
Title: Managing Director

PATENT
03323-P0001B WWW/TMO

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	Lars Severinsson
Serial No. 09/324,506	Filing Date: June 3, 1999
Title of Application:	Disc Brake Caliper -- Reissue of U.S. Patent No. 5,883,035
Group Art Unit: 3613	Examiner: C. Schwartz

Assistant Commissioner for Patents
Washington, DC 20231

Consent of Assignee of Record Under 37 CFR 3.73

The assignee of record, Haldex Brake Products Aktiebolag, hereby gives consent to the reissue of U.S. Patent No. 5,883,035, granted November 10, 1998 to Lars Severinsson, by signature of the below identified officer. Haldex Brake Products Aktiebolag is owner of the aforesaid patent for which reissue is sought by virtue of an assignment from the inventor to Haldex Aktiebolag recorded with the U.S. Patent and Trademark Office on Reel 8598 Frame 0793. Subsequently, Haldex Aktiebolag legally changed its name to Haldex Brake Products Aktiebolag, which name change was recorded with the U.S. Patent and Trademark Office on Reel 10437 Frame 0773.

Dated: 080731

By: 

Name: Magnus Bergström

Title: President

Certificate of Transmission: I hereby certify that this correspondence is today being transmitted to the U.S. Patent and Trademark Office (Fax No. 703-308-3519).

August 7, 2000

Todd M. Oberdick
Todd M. Oberdick

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re: Reissue of Patent 5,833,035

Inventor: Lars Severinsson

Granted: Nov. 10, 1998

DECLARATION OF EUROPEAN COUNSEL FILED WITH REISSUE APPLICATION

Now comes Stellan Petri, of the firm of Strom & Gullickson AB, Patent Attorneys and Lawyers, Studentgatan 1, Malmo, Sweden, who initially prepared the parent Swedish and PCT patent applications corresponding to U. S. Patent 5,833,035 as counsel for the inventor and assignee, and who directed and supervised prosecution of the U. S. application S. N. 08/817,769 in the United States, declaring:

That I did not fully appreciate at that time the true nature and scope of the invention disclosed and claimed in the U. S. application S. N. 08/817,769 resulting in the claims of the subject U. S. Patent 5,833,035.

That my failure to fully appreciate the true nature and scope of the invention disclosed in the original application was without fraudulent or deceptive intention and arose from inadvertence, accident or mistake;

That the realization that the initial claims had not claimed enough came only recently after European Oppositions for brake application mechanisms resulted in intensive study of the scope and contents of this subject matter and the initial claims prosecuted;

That it was then recognized that in the study of accumulated prior art available in this field that broader claims could have been made in this application; and

That accordingly divisional cases were filed with different claims in Europe and at that time I contacted U. S. Counsel to determine whether a Reissue in the U. S. A. would be be feasible.

The undersigned being hereby warned that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the resulting patent, declares that all statements made of his own knowledge are true and all statements made on information and belief are believed to be true.

Date: May 31, 1999


Stellan Petri

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re: Reissue of Patent 5,833,035

Inventor: Lars Severinsson

Granted: Nov. 10, 1998

DECLARATION OF U.S COUNSEL FILED WITH REISSUE APPLICATION

Now comes Laurence R. Brown, Attorney of Record in S. N. 08/817,769 who initially filed and prosecuted that application, now U. S. Patent 5,833,035 as counsel for the inventor and assignee, declaring:

That I did not fully appreciate at that time of filing or at any time during the prosecution of the application the true nature and scope of the invention disclosed and claimed in the U. S. application S. N. 08/817,769 resulting in the claims of the subject U. S. Patent 5,833,035;

That I initially was commissioned to file claims prepared by Mr. Stellan Petri in the U.S.A. and thus to some degree relied upon Mr. Petri and the applicant inventor to know the state of the art and the scope of the invention to be claimed;

That I did not make a patentability search or report during the course of prosecution in the U.S.A.;

That, I erred in failing to appreciate the breadth of the invention that might have been claimed during the prosecution phase; and

That my failure to fully appreciate the true nature and scope of the invention disclosed in the original application was without fraudulent or deceptive intention and arose from inadvertence,

accident or mistake.

The undersigned being hereby warned that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the resulting patent, declares that all statements made of his own knowledge are true and all statements made on information and belief are believed to be true.

Laurence R. Brown
Laurence R. Brown

Date: June 3, 1999

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Lars Severinsson	Assignee: Haldex Brake Products Aktiebolag
Serial No. 09/324,506	Filing Date: June 3, 1999
Title of Application	Disc Brake Caliper -- Reissue of U.S. Patent No. 5,883,035
Group Art Unit 3613	Examiner C. Schwartz

Assistant Commissioner for Patents
Washington, DC 20231

Second Supplemental Reissue Declaration Of Lars Severinsson

I, Lars Severinsson, declare as follows under penalty of perjury:

- 1) My residence, post office address, and citizenship are as stated below next to my name.
- 2) I am the original, first and sole inventor of the above-referenced reissue patent application and make this declaration in support thereof.
- 3) Priority Under 35 U.S.C. 120 -- I do not claim the benefit under 35 U.S.C. 120 of any United States Application. To the extent that such benefit was claimed in my declaration filed concurrently with the present application on June 3, 1999, such claim was in error, and hereby revoked.
- 4) Priority Under 35 U.S.C. 119 -- I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign applications for patent or inventor's certificate listed below and have also identified below any foreign applications for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Sweden (SE) Patent No. 9403624-1, filed October 24, 1994

Certificate of Transmission: I hereby certify that this correspondence is today being transmitted to the U.S. Patent and Trademark Office (Fax No. 703-308-3519).

August 7, 2000

Todd M. Oberdick

Todd M. Oberdick

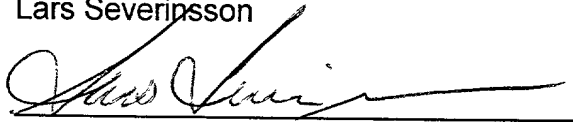
- 5) I believe the original patent to be partly inoperative or invalid because the claims include unnecessary limitations, and patentee claimed less than patentee had the right to claim in the patent. One error in particular is that no independent claim is broadly directed to the concept that the bearing tappets are connected to the caliper, and that the invention operates by a wedging action of the wedge between the fixed tappets and the cross bar. This feature is disclosed as a key feature of the invention, e.g. immediately following the heading "INVENTIONS" in col. 1 at lines 27-30, and in col. 3 at lines 51-54, and in FIGS. 1 and 2.
- 6) This defect arose through error without deceptive intent in that the true invention was disclosed in the application but was not sufficiently claimed in the patent.
- 7) A recent thorough review and study of the claim coverage of this patent revealed these errors and led to the filing of this reissue application.
- 8) Every error in the patent in the present reissue application, particularly those not covered by the prior declaration submitted in this application, arose without any deceptive intention on the part of the applicant.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first inventor:

Lars Severinsson

Inventor's signature



Date:

28/6 2020

Residence:

Hishult, Sweden

Citizenship:

A citizen of Sweden

Post Office Address:

Nordanavagan, S-310 21
Hishult, Sweden

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Lars Severinsson	Assignee: Haldex Brake Products AB
Serial No. 09/324,506	Filing Date: June 3, 1999
Title of Application:	Disc Brake Caliper

Assistant Commissioner for Patents
Washington, DC 20231

Supplemental Reissue Declaration Of Lars Severinsson

- I, Lars Severinsson, declare as follows under penalty of perjury:
- 1) I am the inventor of the above-referenced reissue patent application and make this declaration in support thereof.
 - 2) I believe the original patent to be partly inoperative or invalid because the claims include unnecessary limitations, and patentee claimed less than patentee had the right to claim in the patent. One error in particular is that no independent claim is broadly directed to the concept that the bearing tappets are connected to the caliper. This feature is disclosed as a key feature of the invention, e.g. immediately following the heading "INVENTIONS" in col. 1 at lines 27-30, and in col. 3 at lines 51-54, and in FIGS. 1 and 2.
 - 3) This defect arose through error without deceptive intent in that the true invention was disclosed in the application but was not sufficiently claimed in the patent.
 - 4) Another error is that no independent claim is broadly directed to the concept that the two thrust sleeves, cross bar and lever are pre-assembled as a unit prior to installation in the caliper. This feature of the invention is disclosed, e.g. col. 3, lines 30-36.
 - 5) A recent thorough review and study of the claim coverage of this patent revealed these errors and led to the filing of this reissue application.
 - 6) Every error in the patent in the present reissue application that is not covered by the prior declaration submitted in this application arose without any deceptive intention on the part of the applicant.

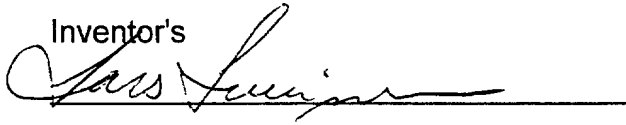
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first inventor:

Lars Severinsson

Inventor's

signature



Date:

2000-03-29 (March 29, 2000)

Residence:

Hishult, Sweden

Citizenship:

A citizen of Sweden

Post Office Address:

Nordnavagan, S-310 21
Hishult, Sweden

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	Lars Severinsson
Serial No. 09/324,506	Filing Date: June 3, 1999
Title of Application	Disc Brake Caliper
Group Art Unit 3613	Examiner C. Schwartz

Assistant Commissioner for Patents
Washington, DC 20231

***Letter Requesting Transfer of Drawings
In Reissue Application (37 CFR 1.174)***

Dear Sir:

Please transfer the drawings upon which the original patent (U.S. Patent No. 5,833,035) was issued to the present reissue application pursuant to 37 CFR 1.174 and MPEP §1413. Applicant submitted copies of the original drawings at the time the present reissue application was filed, and no changes whatsoever have been made in the drawings.

Respectfully submitted,

Todd M. Oberdick

Wesley W. Whitmyer, Jr., Registration No. 33,558
Todd M. Oberdick, Registration No. 44,268
Attorneys for Applicant
ST. ONGE STEWARD JOHNSTON & REENS LLC
986 Bedford Street
Stamford, CT 06905-5619
203 324-6155

Certificate of Transmission: I hereby certify that this correspondence is today being transmitted to the U.S. Patent and Trademark Office (Fax No. 703-308-3519).

May 8, 2000

Todd M. Oberdick
Todd M. Oberdick



US005833035A

United States Patent [19][11] **Patent Number:** **5,833,035****Severinsson**[45] **Date of Patent:** **Nov. 10, 1998**[54] **DISC BRAKE CALIPER**[75] **Inventor:** **Lars Severinsson, Hishult, Sweden**[73] **Assignee:** **Haldex AB, Landskrona, Sweden**[21] **Appl. No.:** **817,769**[22] **PCT Filed:** **Oct. 24, 1995**[86] **PCT No.:** **PCT/SE95/01258**§ 371 Date: **Apr. 24, 1997**§ 102(e) Date: **Apr. 24, 1997**[87] **PCT Pub. No.:** **WO96/12900****PCT Pub. Date: May 2, 1996**[30] **Foreign Application Priority Data**

Oct. 24, 1994 [SE] Sweden 9403624-1

[51] **Int. Cl.⁶** **F16D 65/16**[52] **U.S. Cl.** **188/72.7; 188/71.9; 188/72.9**[58] **Field of Search** **188/71.1-71.9,**
188/72.7-72.9, 196 BA, 196 D, 196[56] **References Cited****U.S. PATENT DOCUMENTS**

5,379,867 1/1995 Macke et al. 188/71.9

5,433,298 7/1995 Antony et al. 188/72.9

5,449,052 9/1995 Macke et al. 188/71.9

5,515,949 5/1996 Baumgartner et al. 188/72.9

5,520,267 5/1996 Gieving et al. 188/72.9

5,547,048 8/1996 Anthony 188/72.9

5,582,273 12/1996 Baumgartner et al. 188/72.9

5,664,646 9/1997 Bejot et al. 188/71.9

Primary Examiner—Robert J. Oberleitner*Assistant Examiner*—Chris Schwartz*Attorney, Agent, or Firm*—Laurence R. Brown[57] **ABSTRACT**

A disc brake caliper comprises a housing (1) to be arranged to straddle a vehicle brake disc, a cover (2) attached to the housing, two thrust sleeves (8), which are connected to a brake pad (5) and which are axially movable in the housing, a cross bar (9) connecting the two thrust sleeves, and a lever (17) for transmitting a brake force from a brake cylinder (4), attached to the caliper, to a cross bar. Bearing tappets (20), parallel with the cross bar, are fixedly connected to the inside of the cover. The lever has a curved wedge (19) with two cylindrical surfaces (19', 19'') in engagement with corresponding cylindrical surfaces of the bearing tappets and the cross bar, respectively. An adjuster mechanism (28) is arranged on a splined shaft (29) rotatably journaled in the bearing tappets.

12 Claims, 6 Drawing Sheets